

CLAIMS

WHAT IS CLAIMED IS:

1. A therapeutic device system for therapeutic application of energy to a living body, comprising:

5 (a) energy sources selected from the group consisting of photon-emitting diodes, and photon emitting diodes in combination with trans-cutaneous electrical stimulators;

(b) a power grid adapted to provide electrical current for operation of the energy sources; and

10 (c) a shapable housing for the energy sources that permits connectivity between the energy sources and the power grid, the shapable housing being selectively moldable to retain a shape configuration when adapted conformably over a treatment area and placed on the living body.

2. The system as set forth in claim 1, wherein the shapable housing comprises a flexible material conforming to the treatment area.

15 3. The system as set forth in claim 2, wherein the flexible material comprises a metal sheet or mesh.

4. The system as set forth in claim 1, wherein shapable housing comprises a curable material that is flexible until cured and, after curing, comprises a substantially rigid material that provides support to the living body.

20 5. The system as set forth in claim 4, wherein the curable material comprises a thermosetting resin that is flexible when heated to a temperature above a design temperature and cures to rigidity when cooled to a temperature below the design temperature.

6. The system as set forth in claim 1, wherein the shapable housing comprises means for altering flexibility of the housing from a substantially rigid state to a substantially flexible state.

7. The system as set forth in claim 6, wherein the shape of the shapable 5 housing is adapted to implement a therapeutic casting modality for immobilizing a portion of the living body.

8. The system as set forth in claim 1, wherein the shapable housing comprises a material with shape-memory retention, such that the material is capable of being reshaped to a neutral state after treatment on the living body is concluded.

10 9. The system as set forth in claim 8, wherein the material with shape- memory retention is selected fro the group consisting of manually deformable materials, heat setting materials, and chemical setting materials.

10. The system as set forth in claim 1, wherein the energy sources comprise both photon-emitting sources and trans-cutaneous electrical stimulators.

15 11. The system as set forth in claim 1, wherein the photon-emitting sources are embedded in the shapable housing formed of an insulating material to enhance heat concentration over the treatment area.

12. The system as set forth in claim 1, wherein the photon-emitting sources are embedded in the shapable housing formed of a heat conductive material to dissipate 20 heat over the treatment area.

13. The system as set forth in claim 1, wherein the photon-emitting sources are covered by an optically transparent protective layer that provides a surface interfacing with the skin which can be cleaned and disinfected.

14. The system as set forth in claim 1, wherein the shapable housing is adaptable to a portion of the living body.

15. The system as set forth in claim 1, wherein the shapable housing comprises an adhesive layer to promote contact with the living body.

5 16. The system as set forth in claim 1, wherein the shapable housing is adapted on a customized basis to mirror individualized templates taken from the group consisting of surgical wounds; surgical scars; trauma-induced scars; skin lesions; abscesses; ulcerations; tumors; cysts; and physiological abnormalities related to soft-tissue, organ, lymph, neurological or vascular compromise of the living body.

10 17. The system as set forth in claim 1, wherein the shapable housing is adapted on a custom basis to mirror individualized templates taken of anatomical zones of the living body selected from the group consisting of breasts, joints, limbs, neck, and the torso.

15 18. The system as set forth in claim 1, wherein the shapable housing is generically-sized for treating conditions taken from the group consisting of surgical wounds; trauma-induced scars; skin lesions; abscesses; ulcerations; tumors; cysts; and physiological abnormalities related to soft-tissue, organ, lymph, neurological or vascular compromise of the living body.

19. The system as set forth in claim 1, wherein the shapable housing is 20 generically-sized for adapting to anatomical features taken from the group consisting of breasts, joints, limbs, neck, and the torso.

20. The system as set forth in claim 1, wherein the shapable housing to serve as a device selected from the group consisting of a wheelchair cushion, an automotive seat cover, a mattress, a bedcover, and seat cover for a chair.

21. The system as set forth in claim 1, wherein the shapable housing is 5 configured for entry into an enclosure of the living body.

22. The system as set forth in claim 21, wherein the shapable housing is adapted to provide three-dimensional exposure to the energy sources.

23. The system as set forth in claim 1, further comprising a connection to a power source capable of activating the energy sources.

24. The system as set forth in claim 23, wherein the power source is contained 10 in the shapable housing.

25. The system as set forth in claim 24, wherein the power source comprises a battery.

26. The system as set forth in claim 25, wherein the battery comprises a 15 flexible structural composition that is conformable to the treatment area.

27. The system as set forth in claim 23, further comprising a voltage regulator operable for uniform distribution of electrical current to the energy sources.

28. The system as set forth in claim 23, wherein the power grid is embedded 20 in the shapable housing.

29. The system as set forth in claim 1, further comprising a control mechanism for regulation of output from the energy sources.

30. The system as set forth in claim 29, wherein the control mechanism comprises manual switches for triggering operation of program instructions processed by a central processing unit (CPU).

31. The system as set forth in claim 30, comprising programmable memory 5 operably coupled with the CPU.

32. The system as set forth in claim 31, wherein the programmable memory contains program instructions for a variety of therapeutic modalities that may be selectively accessed via the manual switches according to protocols for treating a variety of conditions through use of the energy sources.

10 33. The system as set forth in claim 32, including a telecommunications linkage for selecting a therapeutic modality and retrieving a record of the therapeutic modalities that have been implemented on the living body

15 34. The system as set forth in claim 32, wherein the program instructions define combined treatment modalities that sequence different pattern activation of the energy sources within a single therapeutic application.

35. The system as set forth in claim 32, comprising a plurality of the shapable housings and wherein the program instructions permit the control mechanism to implement different treatment modalities for respective shapable housings.

20 36. The system as set forth in claim 32, wherein the program instructions selectively define total elapse exposure time of the energy sources.

37. The system as set forth in claim 32, wherein the program instructions permit a user to define a wave form of electrical current energizing the energy sources.

38. The system as set forth in claim 32, wherein the program instructions permit a user to define the frequency modulation (Hz) of the energy sources within the shapable housing.

39. The system as set forth in claim 32, wherein the energy sources comprise 5 trans-cutaneous electro stimulators, and the program instructions permit a user to select whether the trans-cutaneous electro stimulators use micro-electrical current or macro-electrical current to energize the trans-cutaneous electro-stimulators.

40. The system as set forth in claim 32, wherein the program instructions permit a user to select the type of energy sources for activation within the shapable 10 housing.

41. The system as set forth in claim 32, wherein the program instructions permit a user to select wavelengths for emission upon activation of a corresponding portion of the energy sources.

42. The system as set forth in claim 32, wherein the program instructions permit a user to selectively define the milliwatts of electrical current applied to the 15 respective energy sources.

43. The system as set forth in claim 32, wherein the program instructions permit a user to select the joules of photon emission from the energy sources.

44. The system as set forth in claim 32, wherein the control mechanism 20 comprises a visual display configured to provide visual confirmation of the selected program instructions.

45. The system as set forth in claim 32, wherein the control mechanism comprises means for generating interval auditory reminders of the system activity status according to the program instructions.

46. The system as set forth in claim 1, comprising means for 5 electromyographic reporting of the electrical skin conductivity of the treatment area.

47. The system as set forth in claim 1, comprising means for thermographic reporting of skin temperature alterations over the treatment area for use in pre- and post-treatment comparisons

48. The system as set forth in claim 1, wherein the shapeable housing is 10 configured to function as a peripheral selected from the group consisting of clinician trans-cutaneous nerve stimulation (TENS) equipment and TENS compatible equipment having TENS –compatible power and TENS-compatible control functions.

49. The system as set forth in claim 1, wherein the shapeable housing is 15 physically and programmably configured for use over the treatment area comprising joint articulations of the spinal column.

50. The system as set forth in claim 1, wherein the shapeable housing is physically and programmably configured for use over a treatment area comprising a bone.

51. The system as set forth in claim 1, wherein the shapeable housing is 20 physically and programmably configured for use over a treatment area selected from the group consisting of skin lesions, abscesses, ulcerations, and tumors.

52. The system as set forth in claim 1, wherein the shapeable housing is physically and programmably configured for use over a treatment area comprising breast

tissue that bears a harm selected from the group consisting of fibrous breast density, scars from aspiration, biopsy scars, mastectomy scars, skin lesions, abscesses, ulcerations, and tumors.

53. The system as set forth in claim 1, wherein the shapeable housing is

5 physically and programmably configured for use over a treatment area comprising breast tissue, and the system includes means for operating the system according to a protocol for promotion of lactation.

54. The system as set forth in claim 1, wherein the shapeable housing is

physically and programmably configured for use over a treatment area comprising a harm 10 selected from the group consisting of nerve severance, nerve impingement, nerve inflammation, and nerve disease.

55. The system as set forth in claim 1, wherein the shapeable housing is

physically and programmably configured for use over a treatment area comprising a 15 vascular system with a harm selected from the group consisting of occlusion, compression, and stasis.

56. The system as set forth in claim 1, wherein the shapeable housing is

physically and programmably configured for use over a treatment area comprising a lymphatic system with a harm selected from the group consisting of occlusion, 20 compression, and stasis.

57. The system as set forth in claim 1, wherein the shapeable housing is

physically and programmably configured for use on injuries selected from the group 25 consisting of injuries to muscle, tendon, ligaments, and soft-tissue.

58. The system as set forth in claim 1, wherein the shapeable housing is physically and programmably configured for use against repetitive motion trauma selected from the group consisting of carpal tunnel syndrome, sports-induced fatigue, strains, and sprains of the living body.

5 59. The system as set forth in claim 1, wherein the shapeable housing is physically and programmably configured for prophylactic use against conditions selected from the group consisting of repetitive stress disorders, sports-induced fatigue, strains, and sprains of the living body.

10 60. A method of providing therapy by the action of energy sources, the method comprising the steps of:

conforming to contours defined by a treatment area on a living body a shapable housing for energy sources and a power grid, the shapable housing being molded by this confirming step to self-retain a shape configuration through the use of memory shape-retention means; and

15 activating the energy sources selected from the group consisting of photon-emitting diodes, and photon emitting diodes in combination with trans-cutaneous electrical stimulators, according to a therapeutic protocol..

61. The method as set forth in claim 60, including a step of adjusting a therapeutic modality based upon biofeedback information that indicates the efficacy of treatment.

20 62. In a therapeutic device having a programmable controller and energy sources selected from the group consisting of LEDs, laser diodes, and electrostimulation devices, and combinations thereof, the improvement comprising:

sensor devices configured to provide measurement signals indicating the efficacy of treatment, and

a biofeedback loop configured to interpret signals from the sensor devices and adjust a therapeutic protocol based upon interpretation of the signals.